

CASE STUDY

USING tDAR TO MANAGE LEGACY AND NEW ARCHAEOLOGICAL DOCUMENTS AND DATA, THE PHOENIX AREA OFFICE OF THE BUREAU OF RECLAMATION

Problems of Access, Preservation, and Storage

The Phoenix Area Office (PXAO) of the Bureau of Reclamation (BoR) is responsible for extensive data and records collected and created since the 1970s as part of archaeological work carried out on the lands and canal reaches managed by the federal agency. These paper and digital reports, other documents, images, and related data occupy considerable space in PXAO BoR offices and are difficult to locate, search, use, and share among BoR staff, contractors, researchers, and the interested public. Locating and retrieving documents and data is inefficient and requires an investment of time from both PXAO BoR staff and the person seeking the item. Furthermore, since the reports and other paper records exist in limited numbers, maintaining a single copy of these records in one place raises risks for preservation and the potential for catastrophic loss. Increasingly, new projects include digital as well as paper records, but, without an appropriate tool to manage the digital files, they are either stored on a shelf or printed, adding to the existing problems.

In sum, PXAO had two problems with how to manage the archaeological data and information it is responsible for: (1) how to make the large amount of legacy data and information useful and ensure its long-term preservation economically; and (2) how to treat new data and information in a way that could make it immediately useful and in a system that would ensure its preservation.

Why tDAR?

To solve these problems, PXAO turned to the Center for Digital Antiquity (DA; www.digitalantiquity.org) and its repository, tDAR (the Digital Archaeological Record; www.tdar.org). A 2011 cooperative agreement between DA, located administratively at Arizona State University, and PXAO was set up for PXAO to utilize DA's services and tDAR's features to enhance access to valuable archaeological information and to guarantee the long term preservation of the digital archaeological materials that the agency manages.

tDAR as a Solution

tDAR is a digital archive and repository designed for archaeological documents, images, data sets, and other digital resources. tDAR was developed and is maintained by DA. Users of tDAR can search for documents, images, data sets, and other materials from archaeological projects throughout the world. tDAR users can easily deposit documents, images, and other data. Uploading data to tDAR facilitates broader and easier access and sharing for future uses, such as analysis for decision-making, background studies, public interpretation and outreach, project management and research. These access and preservation functions were just what PXAO was seeking. tDAR provides for archaeologically specific metadata to help users

manage and locate information efficiently and quickly. It also meets the occasional challenges of restricting access to confidential information, such as specific site locations. By placing data into tDAR, users can ensure that the information will be preserved and accessible in the future as new technologies replace current platforms. Learn more about tDAR's functionality and design at www.tdar.org.

The PXAO has committed to digitizing their legacy records as a necessary first step in reducing on-site paper storage and increasing the discovery of their records. The ongoing project with the PXAO followed three primary phases: 1) digitization of existing paper records, cataloging, and data entry 2) development of digital curation strategies and standards for on-call and future contracts, and 3) management of digital archive on tDAR.

Part 1: Dealing with the Legacy Data and Information

The PXAO digitized many of the paper records related to its older archaeological project, in particular from various parts of the Central Arizona Project. It was decided to deposit these digitized records in tDAR where they could be organized and managed more easily. The intent is to ensure that the digital materials are curated to meet the needs of PXAO cultural resource staff to care for these resources, as well as to comply with federal regulations governing preservation and management of archaeological data, such as 36 CFR 79 (see the DA briefing statement on this topic and the Cultural Heritage Partners 2012 report describing the requirement <http://www.tdar.org/why-tdar/compliance/>). The PXAO archaeological collections include some of the most extensive and important archaeological work performed within Arizona during the past century, including:

- The Lower Verde Archaeological Project
- Salt-Gila Aqueduct Archaeological Project
- Roosevelt Dam Archaeological Studies
- Historical Archaeology of Dam Construction Camps in Central Arizona
- Ak Chin Farm Archaeological Project
- Tucson Aqueduct Archaeological Project

Data curators at Digital Antiquity worked with PXAO staff to check the digital documents for completeness and appropriate formatting, accurately describe each document, and organize the digital archive so that documents could be easily retrieved for various uses.

DA and PXAO staff created a simple workflow to manage the deposit of records into tDAR. Digital documents were sent to DA curators, who reviewed them for accuracy, appropriate formatting, and accessibility. They also ensured that the PDF files were passed through an optical character reader (OCR) program so that they can be easily searched. Curators also reviewed the texts and illustrations to identify confidential information that might need to be redacted or designated as "confidential." When encountered, this information, mainly detailed site location information, was removed using Adobe Acrobat Pro's redaction tools. The full report was marked as confidential in tDAR, and access was restricted to users authorized by PXAO. Finally, digital curators created appropriate descriptive metadata for each file and then uploaded them to tDAR as "Drafts" for the PXAO to review. Once the PXAO reviewed and signed-off on the tDAR records, curators changed the records' status to "active."

The Lower Verde Archaeological Project (LVAP), provides an example of the contents of the PXAO digital archive. This project was a large-scale, four-year data recovery project conducted during the 1990s. The project archives include 38 separate documents: chapters from a final, synthetic volume; detailed, technical chapters from three data reporting volumes; five full technical reports; and several appendices that further

document the extensive excavations and analysis. These records are available at <http://core.tdar.org/project/5831>. In some instances, the BoR designated digital files associated with some projects as restricted. The metadata for the restricted files are still visible to all tDAR users, but the file itself is marked as “confidential” to control access to qualified, PXAO-approved professionals.

DA continues to work with the BOR to curate additional projects and associated digital documents, data sets, and images from their legacy collections.

Part 2: Managing Data and Information from New Investigations

In May 2012, at the request of the PXAO cultural resource staff, DA curators began to provide assistance for the organization, creation of new tDAR records, and uploading of digital files to tDAR from new BoR archaeological projects. The new documents, images, and data sets were created by three cultural resource management firms as part of an “on call” contract established by PXAO. The terms of this contract include a digital curation stipulation regarding guidelines for creating digital records and metadata for deposit into tDAR as part of the execution of the archaeological studies. As a result, future work carried out on the lands and canal reaches managed by the agency will be deposited automatically to tDAR, organized in a way that is useful to PXAO internal functions, and preserved for long term access and use by PXAO staff, contractors, researchers, and the interested public. Metadata creation by the same individuals who produce the digital records, in this case the staff of the cultural resource management (CRM) firms doing the archaeology, is an effective way to produce accurate and detailed metadata for the tDAR records. This work not only continues to populate the archive, but ensures that staff time and funds are spent on more critical tasks. By requiring contractors to enter the data, and placing the requirement in the on-call contract, the PXAO is able to reduce the amount of staff time and cost over time. This arrangement also eliminates any additional growth in a backlog of data not properly curated.

Part 3: Use of Records in tDAR and Long-term Preservation

PXAO archaeological records archived in tDAR are organized in a way that makes sense to BoR staff and can easily be discovered, located, and utilized by contractors, researchers, and the interested public. For example, the Lower Verde Archaeological Project record in tDAR has received nearly 800 views since being added to tDAR. Clearly, many more people are able to access and make use of the digital records in tDAR than the paper records in the PXAO offices.

The digital records entrusted to tDAR are properly preserved by following a number of procedures:

- regularly and systematically checking the files in the tDAR repository to ensure that no deterioration has occurred.
- taking action to remedy deterioration if it is detected.
- migrating and/or refreshing digital files to provide for their long-term accessibility and preservation.
- planning for obsolete technology.
- maintaining files in open and preferable formats, accommodating new industry standards for archaeological information
- storing the rich, descriptive metadata with the digital objects to which they are related.

All of these procedures are a regular part of the ongoing services provided by DA for the digital data deposited in tDAR.